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THE UNIVERSITY OF ALBERTA

A STUDY OF INTELLIGENCE AND OCCUPATIONAL ATTITUDES
OF
ADULT EXTENSION STUDENTS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY

by

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APRIL 25, 1961

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Study of Intelligence and Occupational Attitudes of Adult Extension Students" submitted by Patricia Lobsinger in partial fulfilment of the requirements for the degree of Master of Arts.

Date 8 May 1961

ABSTRACT

The major objective of this study is the collection and evaluation of data related to the reasons adults attend General Night Extension classes at the University of Alberta. It was hypothesized that because this group has demonstrated interest in intellectual pursuits at the University level, it would be characterized by a higher than average level of intelligence; that the level of intelligence would exceed the occupational demands on it; and that the resulting occupational dissatisfaction would appear on an indirect test but would not be expressed in response to a direct question.

The sample consisted of 260 adult students who were present on the dates when tests were administered during regular class periods. The hypothesis that the sample was above average in intelligence was tested by administering the Wonderlic Personnel Test and was supported by results beyond the .001 level of probability. In testing the level of intelligence against the occupational level, the obtained chi square was found to be significant at the .01 probability level. The expected discrepancy between responses to direct and indirect methods of attitude assessment was obtained, and on a chi square test of the

relationship between these two measures $P < .20$. Although the P obtained was not statistically significant there does appear to be a degree of relationship between the two measures indicating that for a portion of the group responses from overt and covert levels of personality organization are in agreement. However, the lack of agreement between overt and covert levels of reaction to inquiry about occupational satisfaction points towards conflicting and ambivalent attitudes toward occupation for this group.

This study has identified areas in which more intensive research can be done, including the development of instruments which are more sensitive and appropriate than those which now exist for the adult.

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CHAPTER I

INTRODUCTION

AND

STATEMENT OF THE PROBLEM

Although adult education is a broad and rapidly developing field it has until recently been neglected as an area for psychological research. Rapid expansion of the field due to the increase in the older segment of the population, rising educational standards, shorter work hours and emphases on informed participation in a democratic society has created a need to know more about the adult student. Such knowledge is a necessary prerequisite for efficient administrative programming as well as for optimum student satisfaction.

That the adult student is highly motivated toward further education is self-evident. Thousands of adults attend University of Alberta Extension night classes each year, travelling long distances in winter weather. Their rewards are intangible, for they receive no credits, no diplomas or degrees, yet many return year after year. If questioned regarding their reasons for attending they give answers

which are thoughtful and sincere, though generally too vague and unspecific to provide useful information. Reasons sometimes given relate to the desire for activities removed from home or work, hobby interests and companionship, but such reasons would seem somewhat gratuitous when other diversions are readily at hand. Psychology postulates strong needs when motivation is high so it should be possible to obtain data which would relate to some of the less obvious and more basic motives for attending Extension classes.

This then is the background for the basic hypothesis of this study which states that these individuals possess characteristics which relate to their reasons for attending General Night Extension classes. What are some of these characteristics and how are they related to attending General Night Extension classes which are given at the University of Alberta? With this in mind, the most useful first step seemed to be a survey type of study which would yield information related to characteristics which are vital to the individual's general life adjustment. Such a study would collect and inter-relate background information with psychological theory, pointing out implications for this group. Until some general data is available for the group it does not seem profitable to proceed to carefully controlled experimentation. Even the idea of being research subjects is novel and sometimes repugnant to many of these adults.

Two areas that appear to be basic and relevant for an adult education group are intelligence and occupation. A measure of intelligence would seem to be extremely important for course planning, particularly when related to information about age, sex and education. The intelligence-occupation relationship offered an opportunity to investigate the hypothesis that these people have more intelligence than is demanded by their present occupations. If jobs are seen as unchallenging or boring one might expect to find an attitude of dissatisfaction toward occupation, or an indication that the individual finds this important part of his life somewhat less than interesting. However, it is known that a direct assessment of an attitude often elicits opinions which are not closely related to behavior because attitudes are not always open to conscious inspection. The problem then also implies the development of suitable instruments for assessing the attitude toward occupation for a group such as this.

With the object of penetrating beyond the overt to the covert level of personality function, a modification of an experimental picture-choice technique for assessing attitudes indirectly was included in the study. Since the whole area of attitude research is still in the experimental stage new methods are not inappropriate if they are relevant and appear to hold promise for the area under investigation. Also, since questionnaire methods are commonly employed in surveying

group opinions and attitudes there is value in determining whether one may depend upon the data so obtained. Do individuals tend to give "polite" answers to direct questions or are these answers an expression of the individual's "real" feelings? If in fact it is discovered that responses on the overt level differ from those on the covert level it may be hypothesized that this group does have conflicting feelings toward occupation, and this may be related to taking General Night Extension courses. Because indirect assessment of an attitude to a specific object of inquiry requires that the attention be directed away from the attitude in question, the overall approach of the study was that of a general survey of background information that would be useful for course planning and programming.

STATEMENT OF THE PROBLEM

The study attempts then to establish some meaningful psychological dimensions on which General Night Extension students differ from other people. Once some differences have been established they can be used as points of reference for further study of a more controlled kind. To set meaningful limits to the study the problem was further stated in the form of three testable hypotheses. These are:

1. That the intelligence of General Night Extension class students as measured by the Wonderlic Personnel Test is higher than the average for the test population.
2. That General Night Extension class students have higher intelligence scores than are required by the occupations in which they are engaged.
3. That an indirect assessment of the attitude of General Night Extension class students to their occupations will reveal dissatisfaction with these occupations.

CHAPTER II

CONCEPTS AND ISSUES

RELATED TO THE STUDY

A. Related Studies

A study of the literature does not reveal any research directly related to the topic under investigation. Since this area appears to have been relatively untouched, it may be useful to give an account of some of the issues that usually arise. This section will therefore replace the usual formal review of the literature.

B. Adult Intelligence

A review of the psychological approach to adult intelligence would seem to be mainly concerned with the effect of age on intelligence. But it is generally thought that intelligence is a multivariate concept. Because it is extremely difficult to separate and assess the effect of any one variable, influences other than age cannot very well be left out of a discussion of this subject. Too, factor analysis has shown that the term "general intelligence" is somewhat of a

misnomer, for intelligence is many things and to the extent that amounts and combinations of the various factors enter into any intelligence test there will be variation in the quantitative results. It now appears that factors vary in number, in combination, in degree of influence at different age levels, and that tests used at one level may not be suitable for another level.

For these and other reasons the interpretation of psychological research on adult intelligence is a vexing problem for those attempting to use it. Adult educators are faced on the one hand with so-called "mental growth" curves which show intelligence declining with age, and on the other hand with adults who demonstrate continuing ability to learn high-level material. They find it difficult to reconcile research evidence of declining ability with their everyday experiences with older students. Mental growth has traditionally been illustrated by age-intelligence curves, and the decline that has generally appeared in these curves has raised questions about intelligence testing. If, however, it is remembered that rather than increasing or decreasing quantitatively with age, intelligence probably changes qualitatively, such curves are seen in a different light. Mental growth curves are, in reality, a series of overlapping curves of the various functions of intelligence and the operation of any one of these is obscured in the general curve. Linked to this is the tendency toward greater individual

differences that comes with experience, and this too complicates interpretation of the general curve. It would seem that mental growth curves are but a useful descriptive device, and Anastasi (1958) feels they would be better called "age progress curves" since they differ with culture, group and test employed. She says, "Depending on the age of the subjects tested and the specific intellectual functions measured, age curves may show a continuing rise throughout life followed by a levelling off with no decline, or a rise followed by a gradual or steep drop."

Many of the difficulties encountered in using the results of cross-sectional studies could have been avoided if the assumptions underlying their interpretation had been clearly understood. Such studies assume that experiential backgrounds of the different age groups tested are equal, when this is in fact not true. The chronological aspects of environment operate differentially in the development of measurable intelligence in the individual. The knowledge and understanding of the effects of such factors as years of schooling, changes in teaching content and techniques, and pervasive communication media, are vital to the interpretation of these studies. Therefore one cannot safely infer anything about the trend of intelligence within the same individuals as a function of age unless the individual has been tested repeatedly at different age levels.

Once it is clearly realized that intelligence is affected by variables other than age, and influences relevant to a particular situation are assessed, the problem becomes one of determining level of ability to learn in that situation. Adult educators express concern about the meaning and relation of the concepts "ability to learn" and "intelligence."

E. L. Thorndike (1928) in early experiments on adult learning ability found that older and younger people differed very little on equated experimental performances. He felt that factors such as lack of interest in learning and lack of confidence in ability had most effect on adult ability to learn. His experimental subjects showed very little decline in learning ability before thirty to forty years of age, and after that a gradual rate of decline of about 1% a year to a comparatively late age. In those instances where tasks were meaningful he thought the adult compensated for perceptual and speed of response changes by greater effort and experience. Kay (1955) points out that there is an "obverse side to the coin of experience," that previous learning may operate to the disadvantage of performance, and habits that were favorable to younger learning may be handicaps in later years. He points out that much of this may be obviated by sustaining broad interest patterns and continuing to exercise intellect in order to maintain flexibility. Miner (1957) equates reasoning, developed learning ability and manifest intelligence. Anastasi (1958) feels that the basic difference between learning curves

and mental growth curves is that the conditions for the former are more rigidly controlled. Both reflect present state as a result of development of aptitudes. Since this is essentially what a test of general mental ability measures, it would seem that ability to learn may be measured by tests.

Bayley (1955) and others have shown that variability tends to increase with age so it seems unlikely that it will ever be possible to establish age limits for ability to learn. Native potential, experience, and motivation all combine to make intelligence a very individual matter. No sooner has one found data which show that for a certain group intelligence declined at a certain age, than other data appear in which both the peak of intelligence and its rate of decline are different. With this in mind we turn now to an historical consideration of studies related to adult intelligence.

Over time, the literature on age-intelligence reflects two trends in psychology; the changing theoretical approach to conceptual intelligence and the development of new methods and instruments of measurement. The gradual move away from the idea of "general intelligence towards aspects of intelligence has resulted in a closer look at intelligence at all age levels. Accompanying this is a concern that tests be suitably and meaningfully related to specific uses to permit valid prediction. The use of standard scores rather than I.Q. permits

comparisons between tests and among various data from studies. Efforts to obtain large and representative samples for standardization of tests contribute both to the usefulness of tests and to data available for comparisons. Until recently, most of the data available have come from cross-sectional studies; however, information from groups which have been tested at intervals over the years is now appearing from studies which were begun some time ago. Learning and psychophysical experiments produce information on such things as changes in perception, speed of response, transfer of training and other related concepts.

It seems a little obvious to say that psychologists have long realized that the intelligence of an adult is not quite the same as that of a child. Yet it was not until 1932-33 when the results of the large scale studies of Miles and Miles (1932) and Jones and Conrad (1933) were published, that definite statements were made about adult intelligence. In the Miles and Miles study (a part of the Stanford Later Maturity Study) a shortened, speeded version of the Otis Mental Ability Tests was administered to 823 subjects, ages 7 to 94 years. The Jones and Conrad sample, mainly rural, used the Army Alpha to test 1191 subjects. The aim of each study was to assess the effects of age on intelligence in a fairly homogeneous group. Both show maximum intelligence scores for those in the early twenties and lower scores thereafter. This was true also for the standardization group for Wechsler's 1939 Intelligence Test where

the subjects were all residents of New York state but selected to approximate national census distribution. In all three there is a tendency for variability to increase with age, and the slower rate of decline seen on Jones' and Conrad's age curve could be a function of test used, differences in group composition or different educational experience.

A study in which the members of the group were well equated in respect to education was done by Weisenberg, Roe and McBride (1936). In this study the age-intelligence curve differs somewhat from previous findings. Two vocabulary tests, the Terman and the Thorndike were employed, and on the former highest scores were exhibited by 30-35 year olds and scores did not decrease for older age groups; on the latter, the curve rose right through to the 50-59 year level. During the next decade many studies confirmed the finding that intelligence scores decline less with age when a vocabulary test is used as a measure. Two such studies that have the advantage of using large samples but in which educational influence was not accounted for are those of Thorndike and Gallup (1944) and Foulds and Raven (1948). Thorndike's and Gallup's results showed that for a sample representing the voting population, scores on Thorndike's vocabulary test remained relatively constant until age 50 with little drop until 60. Foulds and Raven, using the Mill Hill Vocabulary Test, found that scores increased to 25 years and remained constant after that for 25 or 30 years. Where attempts

were made to approximate the educational distribution in the population as a whole, Shakow and Goldman (1938) found that successively older age groups of adults tested with the Stanford-Binet vocabulary showed higher scores up to the 50-59 year group; and Fox (1947) comparing the vocabulary of two groups 40-49 years and 70-79 years respectively, found no reliable decrease for the older group.

Further evidence for the effect of education on the age-intelligence curve came from the standardization group for Wechsler's Adult Intelligence Scale (1955). Compared with the curve for the standardization group for the earlier Wechsler-Bellevue Intelligence Test, the W.A.I.S. results show the highest scores at a later age and a slower rate of decline with age. It is quite possible that this reflects the difference in education in the years intervening between the two tests, for Corsini and Fasset (1953) used the Wechsler-Bellevue Intelligence Test to test 1072 males in San Quentin and found consistent differences among the various subtests; in particular, a rise of 9% in verbal ability with age, as contrasted with the original drop of 8% on the standardization sample. Miner's (1957) results using Thorndike's vocabulary test showed a rise in mean scores to ages 35-44 and a gradual drop after that. His sample of 1896 persons was carefully chosen to match census data, and he checked the possibility that the observed decline might be due to variables other than age. Where he controlled for

education, the original trend indicating a decline in intelligence with age for the more educated is completely reversed; and for those less well educated the original trend disappears. Apparently the decline in the older age groups resulted from the large number of low-education individuals in the population who were aged 55 or more. He concludes that

"...although it is impossible to specify the exact shape of curves of intellectual development, there is probably a rise for all educational groups with age that, after termination of schooling, tends to be somewhat more marked in those with more education, but that never disappears even in those with practically no education."

Studies where subjects are matched on education are not common but Nyssen and Delys (1952) report scores on a vocabulary test where subjects were matched on education, occupation, social class and city size. They found highest scores for the 30-40 year olds, scores little lower for the 50-59 year olds, and no score differences between age groups in the upper intelligence level. Another study in which the influence of education has been kept to a minimum is that of Pacaud (1955) whose 4000 French railway workers could be divided into two homogeneous age groups, each of which had similar occupational and social background. She found successively lower scores for older age groups in all functions tested (intellectual, memory and psychomotor). She also found that score differences were less marked

among the top scoring twenty percent of the subjects. Wechsler (1958) interprets her finding (that there is almost no difference in rate of decline of scores with age, and no large differences in scores themselves for the two groups) as meaning that for this sample at least the "decline with age is real." However, this must be looked on as a group in which the individuals are selected by their vocational, national and cultural attributes. Jones (1955) in re-examining the results of his 1933 study, and using a portion of his data where parent and child education were much the same, concludes that education was not a factor in the lower scores he obtained for his older subjects. He also concluded in his re-examination that a significant score lowering did occur that was not accounted for by factors of speed, vision or hearing.

Opinions regarding the influence of speed on intelligence test results vary sharply. Early investigations by Catherine Miles (1934) Lorge (1936) and Copeland (1938) indicated that timed tests handicapped the older subjects. Miner quotes a 1935 study by Christian and Patterson in which a vocabulary test was given Minnesota freshmen and some of their adult relatives. When administered on a timed basis there was a slight but significant drop; when given as a power test, there was a reliable increase in score with age. Miner concludes that what is taken for intellectual decline in some cases may be decreases in motor and perceptual abilities. The data of Corsini and Fasset (where there was

no matching for education), showed that scores for the Wechsler-Bellevue sub tests which were loaded with non-intellectual components such as speed were lower for older age groups. Gurvitz (1952) used the same test as well as the revised Army Alpha and Army Beta to test two groups 20-24 years and 45-49 years. His results suggest that speed is the most important factor in the tests for producing lower scores. Doppelt and Wallace (1955) obtained different results with five timed and untimed tests on the group of 465 who comprised the older population (60 and over) for the Wechsler Adult Intelligence Scale. Results from using the tests as power tests rather than as time limit tests showed no statistical differences. Birren's (1955) and Kay's (1955) experiments on speed of simple responses and on perception suggest that a loss of speed in the old is functionally related to mental performance. Anastasi (1958) says that where tests involve speed, visual perception and spatial relationships older age groups tend to make lower scores. Foulds and Raven (1948) using the Unspeeded Raven's Progressive Matrices Test, found that average ability "to form comparisons and reason by analogy" was greatest for the 14 year olds, remained constant up to the 25 year age group, and was successively lower to the 60 year olds. Kay's study of a complex type of sensorimotor utilization of information showed that errors and time increased with the increasing difficulty of the task at each successive age level. The assumption behind all these studies is that

motivation is high, but this may not always be the case, particularly if the tasks measured are not stimulating, related to experience and worthwhile in adult eyes. This is particularly true where group testing is the method used in a study, and anticipated knowledge of results probably is not a motivating factor.

All the preceding studies were either on selected groups or cross sectional samples of the population. The longitudinal study method, where the individual's progress through the years is systematically studied, has been the source of recent data which further illuminate the nature of adult intelligence. The cross sectional method makes assumptions concerning comparability of age groups and similarity of experiential backgrounds that often result in controversy regarding interpretation of results. The longitudinal method has its own difficulties too, for it is not easy to assess the effects of being a member of such a study, and selective factors operate here as well. However, each method would seem to have strengths in comparison with the other, and there can be little doubt that both are necessary for investigation of the effects of age on intelligence. Three longitudinal studies are of particular interest here: Owens' (1953) retest of 127 men who had taken the Army Alpha as college freshmen thirty years earlier; Bentz's (1953) retest of 208 business executives who had previously taken the A.C.E. Psychological Exam some 6 to 10

years before; and Bayley's (1955) retest of subjects and spouses of the Stanford study of gifted children. Owens' adults (average age, 50 years) when retested with the Army Alpha showed a significant gain in total score, gains on seven of the eight sub tests, and no significant decreases. Bentz's group showed significant gains for those under 35 years, and small losses for those over 40. Bayley's sample of over 1000 subjects, 20 to 50 years old when first tested with the Concept Mastery Test, showed significant gains for all subgroups when retested about twelve years later. Bayley (1955) found that the age curve for the subjects in the Berkeley Growth study was not the same as Wechsler's and others of the time in that intelligence test scores were still increasing through age 25. To find out what happens when the age curve is extended she combined her own and Owens' results to make a composite age curve of intelligence. The resulting curve shows intelligence increasing to age 50 for both groups, with a larger gain for the Stanford group. Here is evidence that at least for superior subjects, intelligence as measured by "verbal concepts and abstractions" can increase with age. In trying to account for the difference in curves obtained, Bayley suggests that the difference in gain between the two groups may be due to the room for expansion upward that the concept Mastery Test provides. As regards the continued increase in scores for the composite curve, it has been known for some time from studies

such as Terman's (1947) that intelligence does not decrease as soon or as rapidly with age for those with superior intellectual ability. Bayley herself feels that much of the difference is due to the different study method (longitudinal as against cross-sectional), but points out as well that all the subjects have been exposed to an "enriched environment" as a result of educational changes, mass media and such "pervasive environmental conditions."

C. Intelligence and Occupation

The problems of measuring adult intelligence and interpreting the obtained results are seen to be varied and complex. Where, (as in the present situation), the setting is an academic one, standard tests of scholastic aptitude can be relevant and useful, particularly if all conditions and procedures for good testing are carefully observed. Information from such tests can then be related to data from the more usual sources, such as course-entry forms, and lead to greater insight into student motivation.

One such relationship that is particularly pertinent for an adult group is that between occupation and intelligence. An adult's occupation takes up the major portion of his waking hours and may influence the whole direction of his life, so it should be useful to know how it affects and is affected by factors such as intelligence.

A recent survey of the relationships between intelligence test scores and background variables concludes that there is a high relationship between occupation and intelligence test scores (Miner, 1957). Such studies as those of Stewart (1947), Wolfe (1954), Anderson Brown and Bowman (1952), and others, have demonstrated the existence of an occupational hierarchy based on intelligence test scores. There is much overlapping from occupation to occupation, and a wide range within occupations, but authorities such as Blum (1956) feel that the existence of such a hierarchy is no longer in dispute.

This is not to say that there is a high correlation between measured intelligence and measured achievement on a job, for correlations between intelligence test scores and job performance over a broad range and the best appear to be from .30 to .60. In such situations influences such as interests, motivation and personality must also be considered. But opinion seems to be general among psychologists in industry that intelligence tests are a valuable aid in selection, placement and promotion. As would be expected from the earlier discussion on the intelligence-education relationship, intelligence tests are more useful at the higher occupational levels where more education is likely to be required. Ghiselli and Brown (1948) in a study of the effectiveness of tests used in industry found them to be more useful as the

number and complexity of functions demanded on the job increased.

Vernon (1950) says that during World War II the best predictor in selection of officers and specialists in the British Army was the verbal group intelligence test.

With regard to the relationship between intelligence and an occupation Miner, suggests that there are minimum entrance requirements in mental ability for the higher level occupations at least. It appears too that there may be optimum requirements within which jobs are most satisfactorily performed, and Blum says that the evidence from the many and diverse studies warrants that statement that "...for a particular occupation a score within a certain range is likely to be best." Snow's (1927) subjects of lesser mental ability showed most dissatisfaction with fairly complex work. Anderson (1929) found that high-potential employees started at low-level jobs tended to leave because of lack of challenge. Viteles' (1924) data shows a clear relationship between score level and job tenure, those individuals scoring too high or too low in comparison to job demand remaining on the job for shorter periods. Bills (1923) finding that minimum and maximum test scores varied with the kind of occupation, demonstrated that percentage turnover for high scoring individuals increased as job difficulty decreased. Bellows (1949) cites two unpublished studies where use of tests in selecting personnel reduced turnover greatly. The important point here is that an individual's intelligence is a "factor

in predetermining his job satisfaction."

D. Attitude Assessment

The results of these and other early studies are implicit in industry's use of minimum cut-off scores for job entrance requirements. But it is not always remembered that just as an individual may have too little intelligence to perform a job, so may boredom and frustration result for the individual of superior intelligence whose job does not present a challenge. Unless job complexity-demand and intelligence level are suitably aligned there will generally be dissatisfaction. Such dissatisfaction may be demonstrated in high turnover, (as above), or in lowered production, lessened efficiency and other overt indicators. Criteria such as these have been found useful in measuring job satisfaction but are often more indicative of what the employer considers "satisfaction" than does the employee. That the individual employee's needs may differ from and defeat those of the employer was shown clearly in the Hawthorne and other subsequent studies.

Individual job satisfaction, or occupational adjustment, is more often viewed in recent years as a part of the individual's total adjustment. Weitz, (1952) studying the relationship between general satisfaction and job satisfaction, found that they were fairly highly

correlated. Morse (1953) administered questionnaire interviews to over 800 clerical workers and supervisors and concluded that level of job satisfaction is the result of the balancing of need-tension level and amount of return available; and that unless the environment has the power to reduce and satisfy needs, there is dissatisfaction.

Schaffer (1953) postulated that "...overall job satisfaction will vary directly with the extent to which those needs of an individual which can be satisfied on a job actually are satisfied; the stronger the need, the more closely will job satisfaction depend on its fulfillment..." He correlated relative satisfaction of each subject's highest need with overall job satisfaction and his results were significant at the .001 level. His subjects were professional and semi-professional men, and as might be expected at this level, their strongest needs were "creativity-challenge" and "achievement-mastery." This is evidence that these needs may be important at the higher occupational levels if the individual is to achieve satisfaction.

This finding agrees with the occupational theories of several of the well-known writers in this field who have come to feel that the need hierarchy theories of A. H. Maslow (1943) are relevant and useful in explaining occupational choice and adjustment. Centres, (1948) studying the motivational aspects of occupational stratification says that the findings of his survey "...are rather strikingly in

harmony with...A.H. Maslow's...hierarchy of prepotency..." Some authors postulate a somewhat similar continuum of satisfaction based on an occupational rigidity-flexibility dimension, where the greatest opportunity for freedom of expression in work is at the highest level. They point to the many studies which show the important needs differing with occupational level; those at the lower levels being extrinsic to the occupation (e.g. pay, hours, etc.) and those at the higher levels more intrinsic in nature (e.g. involvement in work, chance to use abilities, etc.). One interesting line of investigation hypothesizes that feelings about the job and incidence of neurotic illness are related. Fraser (1947) studied the relation between attitudes to the job and wages, and incidence of neurotic and physical illness among factory workers. His results show that feelings re job are related to incidence of neurotic illness, though here the problem is one of cause-effect relationship with frustration of needs as a possible causal factor in neuroses of occupational origin. It seems clear that occupational frustration of an individual's important needs can result in dissatisfaction, and that at the higher occupational levels there is a need to use intelligence for "creativity and achievement." (Shaffer)

Needs, being part of the individual's dynamic inner organization are not open to study by direct means but must be inferred from behavioral manifestations. It has been said that

"we 'infer' from the dim or clear awareness of our own state of mind the state of mind of another person. It is not inference in the logical sense of inductive reasoning, but arguing by analogy from one particular to another." (Cohen, 1945)

Murray (1938) defines a need as

"...a hypothetical variable used to explain certain facts of overt or covert behavior.... It finds its expression in inner feelings of tension which seem to impel an individual to strive for a certain goal."

Darley and Hagenah (1955) feel that occupational adjustment is inseparable from total adjustment and speak of "...differential job adjustment, where actual occupational involvement reflects personality and provides opportunity for fulfillment of personal needs and drives."

The needs basic to the total personality will affect the individual's perception of and attitudes to such a social involvement as occupation.

The "cognizance" need to discover and learn transforms the child into the adult. Such a need appears to be especially strong in the more intelligent person, and if this is so, the effect of an unchallenging, "dead-end" occupation on an individual of better than average intelligence would color his perception of his occupation. Schaffer (1953)

extracted two clusters of needs from his intercorrelations of need strength scales, one group containing "passive, hostility-restraining need," the other, "assertive, aggressive needs," and says that his

data suggest that people "tend to underrate the importance to themselves of these latter needs." It is probably true too that such needs are neither clearly perceived nor understood even if felt, for statements of needs differ depending on how they are elicited. Haire and Gottsdanker's (1951) data from a study of factors influencing industrial morale show need strengths differing when direct and indirect methods of assessing them are used.

Direct attitude measurement appears to elicit conscious verbal opinion, such opinion being based on the more general and often less articulate attitude. Since data from direct type instruments of attitude measurement often only narrow the margin of error in prediction of behavior, there have been, during the last twenty years, many attempts to measure the attitudes which underly opinion. Self description should bear some resemblance to behavior, but the low correlations between the two have made it clear that what the individual says he would do and what he does are not always the same; and that he does not always comprehend the reasons for his behavior. Getzels (1952) used parallel direct and projective instruments to investigate overt and covert levels of attitude and personality organization. His instruments contained "socially conflicted" and "socially neutral" objects of inquiry and his findings bear directly on the problem of attitude levels. He found that the discrepancies between overt and covert levels

of reaction were maximal for socially conflicted objects, minimal for socially neutral objects; and that the discrepancies were maximal for the maladjusted and minimal for the adjusted group. Getzels interprets his results as favoring the concept of "levels" in personality-attitude theory. It would seem then that the social learning which underlies attitude formation makes it difficult and often impossible for the individual to verbalize rationally in a situation where he is personally involved. Expressed attitude to occupation is affected by obvious threats such as jeopardizing one's position, but there are also more subtle effects from living in a society that cannot be said to encourage verbal expression of deeper needs, and may indeed often promote suppression and repression of feelings that do not meet societal norms. For reasons such as these, direct measurement of those attitudes related to external and survival needs may be valid and useful. Where needs are acquired and more intimately related to personality, it may be necessary to infer them by a less direct method.

Currently there are several techniques for measuring and assessing attitudes indirectly--disguised tests, systematic rating bias in testing, and projective techniques--all have been found useful. There is general agreement (Anastasi 1957, Guilford, 1959) that they are all still in the experimental stage with particular need for

intercorrelational studies to determine what they measure. As the aim is to "get past the psychological censor that inhibits in direct questions" (Sanford, 1950), it is difficult to find suitable criteria for validation of these methods. However, most writers agree that there are several techniques which hold promise as means of measuring attitudes without destroying their unique form in the process.

One method of assessing attitudes stems from Murray's work with projective tests. This method employs pictures as relatively neutral unstructured stimuli which are sufficiently ambiguous that the individual uses them as a screen on which he projects his needs, fears, wishes, attitudes, etc. Cohen likens the psychologists' use of projective techniques to the physician's x-ray. He says that projection

"...helps to shape our relationships with the outer world...and is something more than a subjective mental process. It has a social quality inasmuch as it is the main avenue of the mind's interpretation of its environment, human and material."

It is this social aspect of projection that makes it useful for investigating attitudes. The attitudinal "readiness for response," being the individual's affective view of a social object or institution, predisposes him to respond in terms of pleasant or unpleasant feeling. Like and dislike, satisfaction or dissatisfaction, are projected on the

neutral stimulus in terms of the individual's internal organization. The experimental work of Bruner and his associates at Harvard (1947) has shown the importance of need and value as internal determinants of perception. Abt, (1959) after reviewing this and other experimental evidence suggests that personality colors perception and leads to perceptual selectivity in projection when a neutral stimulus is presented.

Pictures and photographs are often used in indirect methods of assessing attitudes and personality measurement and appear to be acceptable as neutral stimuli because they conform so readily to everyday experiences. Campbell (1950) feels they are especially useful as stimulus material because personality misfunction is so often most clearly demonstrated in interpersonal judgments. There have been attempts to relate picture judgments to identification theory (Chambers, 1957), but research here has not yielded any conclusive data. The phenomenon that takes place here would seem to be more closely related to Sappenfield's (1956) "perceptual" identification. There has not been much investigation of the rationale which underlies picture judgments, and, so far as can be ascertained, only one study of the variables which may operate in situations where pictures are used. Campbell and Burwen (1956) in checking on the assumption that like photographs yield consistent individual differences, found some

inconsistencies but general support for the hypothesis. It appears from their work on stimulus generalization of respondents that it is necessary to control for age and sex of photographee, but that in general similar photographs of people do elicit consistent individual response differences. Chambers, (1957) using college annual photographs, (with college students) controlled for sex by using separate male and female forms of test material and allowed subjects to assign predetermined trait categories to the pictures they judged to be highest and lowest on the trait in order to control for differences in stimulus value.

Chambers' study is one of several which use photographs to disguise the intent of the test from the subject to prevent him from responding self-consciously and in a manner that is perhaps more acceptable to society than it is revealing of himself. Campbell suggested in 1950 that the "disguised-structured" test of social attitudes was a most useful way to obtain an objective score for an attitude. This is a method presenting subjects with an objective task to be solved and loading the task with content relative to an attitude. As the test is structured and scorable, systematic error or persistent tendency among responses would, by inference, appear to be the attitude relative to the content area of the task. Flyer (1952) applied this technique to personality evaluation, obtaining an objective score by measuring the

effective choice bias among sixty-four photographs. The median correlation coefficient between rating on a trait and picture choice data was .72, between self-rating and picture rating, .52. Not only did subjects assign "most personally acceptable" traits to liked pictures (and vice versa), but in a later study (Flyer, 1952) they rated themselves high on such traits. Chambers' subjects showed correlations ranging from .32 to .52 between like or dislike of pictures and classmate ratings and measured trait rating on the Guilford-Martin GAMIN Test. The equivalent stimuli (photographs and people) evidently call forth an affective reaction that is related to self image and, since in neither study were subjects as a whole aware of a connection between separated tests, this reaction cannot be said to be a conscious one. However, test disguise, test difficulty and the meaning of the task assigned in the above-mentioned studies do not entirely conform to Campbell's criteria for extracting attitude bias as the systematic error in a performance task, so it is possible that the test situations appeared artificial and this affected motivation. DeRath and Carp, (1959) observing that people tend to react differently to groups dissimilar to their own, used the picture-choice method to investigate occupational identification. Using college students as subjects and Flyer's Picture-Choice Test materials, they found a consistent tendency to perceive as "liked best" pictures of persons in the occupational

identification. Using college students as subjects and Flyer's Picture-Choice Test materials, they found a consistent tendency to perceive as "liked best" pictures of persons in the occupational groups most closely related to subjects' college majors (and vice versa). They found also a tendency for mean score to increase with degree of expressed interest that was significant beyond the .01 level. In these three studies the positive correlations between affective response to photographs and unconscious subjective feelings strongly suggest that photographs are a satisfactory projective device. When an indirect estimate of feelings concerning an area is desired projection may evidently be controlled by structuring the test content so that responses are specific to that area. Such a method would seem to be particularly useful in assessing attitudes where the aim is to penetrate through verbal opinion to the deeper level of personality elements that determine behavior.

CHAPTER III

METHOD

A. Background for Selection of the Sample and Tests

The Extension Department of the University of Alberta offers many and varied courses, of which the General Night Classes form but one section, others being Fine Arts, and Business and Professional. It was felt that the Fine Arts section was probably a special interest group and that this interest set them apart from the general run of students. Business and professional classes are aimed at developing and improving skills connected with specific occupations and are often co-sponsored by business firms and organizations and so would be somewhat different to classes which are made up of persons who come of their own volition. Except for these two groups no attempt was made to limit the composition of the sample, as it was felt that an important aspect of this study was the collecting and relating of descriptive characteristics.

Both method used and tests administered were dictated by conditions peculiar to the situation. Since subjects are adult and attendance voluntary, motivation is crucial and care and tact were of extreme importance if co-operation was to be obtained. It was originally thought that the night student group would be asked to volunteer and testing could be done in several large groups to control the test environment. However, it was realized that this method of obtaining subjects might produce an overly-large proportion of persons who for one reason or another had a particular interest in testing and create a sample bias. The decision was made to administer tests in regularly scheduled class periods and to attempt to create interest by explaining that the collection of research data would be used to assist in course planning and other areas related to course taking. At the same time it would be made clear that the grouping of the data ensured anonymity of individual results, and that there was, of course, no compulsion to take the tests.

A letter was sent from the Extension Department (Appendix 1) to each lecturer and arrangements were then made with individual lecturers to fit talks and testing into the time immediately before or after classes or during the class break. Because most lectures are given only once a week and terms average about two months, many lecturers were loath to shorten time available for

teaching. Thus choice of tests was dictated by the necessity of obtaining and maintaining the co-operation, interest and goodwill of all concerned. It is suggested that this may very often be the case if one wishes to study any large sample of adults.

Each class was visited twice, initially to explain the purpose of the research, to develop interest and rapport and to administer a questionnaire. At this time students were assigned a card with a code number to ensure anonymity and this code number was used on all test materials. A second visit to each class was made two to four weeks later and the Wonderlic Personnel Test and the "Interaction Scale" were administered. Thus the obtaining of a subject was dependent not only upon attendance at each of the two classes, on keeping or remembering the code number, but also the willingness of the subject to do all three of the tasks presented. Even with the assurance of anonymity through the use of code numbers and the grouping of data, many subjects rejected the second phase of the study entirely. So conditions for optimum motivation were somewhat less than perfect. The need for haste, pressure to get home or down to the tasks at hand, attitudes of both students and lecturers--all had an influence which it is hoped was kept random by the size of the sample.

B. Subjects

Subjects were adult students attending University of Alberta Extension General Night classes on the dates when testing was done during the Spring Session, 1960.

General Night classes are open to all and given mainly by university professors. Students attend of their own volition and pay fees. There are no examinations given and the courses do not carry any university credits. A list of the classes surveyed follows.

Italian	1 class
Spanish	5 classes
German	2 classes
Effective Reading	2 classes
Essentials of Good English	2 classes
Law in Action	1 class
Office Management	2 classes
Personality Development	1 class
Geology	2 classes
Great Books	1 class
Income Tax Procedures in Business	1 class
Landscape Design for Homeowners	1 class
Modern Political Ideas	1 class
Russian	1 class
Ukranian	1 class
Polish	1 class

C. Description of the Sample

(N will vary, depending on N answering any question)

Number of students who completed questionnaires	= 374
Students completing Wonderlic	= 272
Students completing "Interaction Scale"	= 274
Students where data available on all of above (166 male, 94 female)	= 260

There is a large discrepancy between the number who answered questionnaires and those who completed the two tests. This may be due to a drop in attendance, and/or to dislike and non-completion of testing. There were several outright refusals during the second (testing) class visit, indicating that psychological testing is not something that this group takes for granted as does the average full-time student. Since fear or ignorance regarding psychological tests may influence performance and test results, data was obtained regarding familiarity with such tests.

TABLE 1

PSYCHOLOGICAL TESTS

TAKEN PREVIOUSLY BY G. N. EXTENSION GROUP

	NO	YES		
		Many	Few	One
Male	80	13	58	14
Female	47	5	26	10
TOTAL	127	18	76	24
Percentage	52	7	31	10

When it is realized that over 60% of the group have had little or no experience in the taking of psychological tests, it becomes very important that tests used appear sensible and are easily understood.

TABLE 2

DISTRIBUTION BY AGE AND SEX FOR EXTENSION GROUP

Sex	N	Age Range	Mean Age	Median Age	sd.
Male	160	16 - 66	35	32	10
Female	93	16 - 55	34	32	9.5
TOTAL	253	16 - 66	35	32	9.8

TABLE 3

EDUCATIONAL ATTAINMENT OF EXTENSION STUDENTS

	N	Grade School	High School	High School+	Degree *
Male	164	25	73	28	38
Female	89	10	34	32	13
TOTAL	253	35	107	60	51
Percentage	100	14	42	24	20

- *
 Grade school - up to and including Grade X
 High school - completed Grades XI or XII, includes commercial
 High school+ - completed Grade XII, plus special training, e.g. nurse
 Degree - any and all university degrees

TABLE 4

EDUCATIONAL ATTAINMENT OF SUBJECTS

BY OCCUPATIONAL LEVEL

Level	N	Degree	High School+	High School	Grade School
I	21	21	0	0	0
II	54	19	15	15	5
III	65	2	13	38	12
IV	29	0	8	17	4
V	18	1	2	12	3
VI	12	1	0	5	6
Housewives	42	6	11	20	5
Students	12	1	11	0	0
TOTAL	253	51	60	107	35

TABLE 5

NUMBER OF YEARS EMPLOYED

N	4 years or less	5-9 years	10-14 years	15-19 years	20 years or more
196	20	39	47	28	62
Percentage	10	20	24	14	32

TABLE 6

MARITAL STATUS

N	Married	Single	Divorced	Separated	Widow(er)
Male	115	53	0	2	3
Female	53	30	1	1	2
TOTAL 260	168	83	1	3	5

TABLE 7

NUMBER OF CHILDREN PER FAMILY

Number	none	1	2	3	4 or more
TOTAL	23	31	45	43	25

TABLE 8

OCCUPATION OF FATHER

Assigning Occupational Level Group	N	Professional and Scientific	Business	Service	Skilled Trades	Un- skilled	Farm
I	20	6	3	3	3	1	4
II	47	11	8	0	10	2	16
III	59	7	19	0	11	2	20
IV	24	1	5	2	5	2	9
V	15	1	1	1	4	3	5
VI	11	0	3	0	1	4	3
Housewives	33	2	13	4	5	3	6
Students	13	2	5	2	2	3	1
TOTAL	222	30	57	10	41	20	64
Percentage	100	14	26	4	18	9	29

1. See description of occupational groups (p. 53).

D. Questionnaires and Tests

Questionnaire (Appendix 2)

The questionnaire contained questions relating to general background of the subject's education, courses and reasons for course attendance, occupation and attitude to occupation. Although the obtaining of such data was part of the study's purpose, the main reason for administering the questionnaire was to divert attention from the three questions concerning occupation:

- a. "Own present occupation"
- b. "Like present occupation: generally, sometimes, never"
- c. "If you could choose THE occupation you would like best, what would it be?" (Referred to hereafter as 'IDEAL').

These questions formed the basis for comparing answers on direct and indirect methods of assessing attitude to occupation. Questions A and C were combined with the "Interaction Scale" to assess feelings re occupation indirectly. Question B served as a direct measure of feeling about occupation. Further camouflage was provided by separating the indirect approach to occupational attitude from the questionnaire by a period of two to four weeks, during which time it was hoped that subjects would partially forget that the original

questions regarding occupation had been directed at satisfaction-dissatisfaction.

As mentioned above, selection of test materials was influenced by those special conditions which pertained to this group. In selecting a test to measure the group's intelligence the following requirements had to be met:

1. The test must be short: time was limited to a maximum of thirty minutes for the administration of the two tests.
2. The test should have some face validity. Adults will not attempt to do well where the task does not seem meaningful.
3. The test should not be called an intelligence test. These are adults who are mainly unfamiliar with psychological tests and might be threatened by them.
4. Test directions and test format should be clear, easily explained and easily understood. Testing conditions were far from perfect, many subjects were unfamiliar with testing procedures and tests were given to large groups whose minds were often more attuned to class discussion, getting away in time, etc., than to psychological tests.

5. Test should emphasize power rather than speed, as adults are handicapped by speed tests.

In addition to these special considerations the test must be reliable, valid and have suitable norms.

The test chosen to measured intelligence was the Wonderlic Personnel Test, as it meets the above requirements better than most tests available.

1. It consists of only fifty items and has a time limit of twelve minutes.
2. Test content is designed to be suitable for adults.
3. The test is called a "Personnel" test which makes it somewhat less threatening and ties in as well with the overall plan of the study.
4. Test direction are fairly clear, as evidenced by the fact that only two tests were spoiled by subjects' not following directions. Test format could be improved, since many older persons require larger print, clear separation of items. What effect this had on test results is not known.
5. The test is a combination speed and power test and is standardized so that it may be used either way. (The

correlation reported for these two modes of administration is .94.) The test's authors (1939) say:

"The correlations between the scores in the 12-minute period and the unlimited times are quite high . . . but (for older persons) would presumably be lower because of the differential effect of age upon speed . . .

Because of this the test manual provides a table of increments to be added to scores in order to correct for the effects of age and education. The exact method whereby these increments are computed was not available. The manual says: "When comparing applicants in the 20-30 age group to employees of a more advanced age

group:	add to 12 min. raw score of age	30-34	1
		35-39	3
		40-44	4
		45-49	5
		50-54	6
		54 and up	8 "

The Wonderlic Personnel Test (Appendix 2)

The Wonderlic Personnel Test was originally an adaptation and re-standardization of the Otis Self Administering Tests of Higher Mental Ability. Tiffin (1952) says:

"The adaptation consisted of selecting from the original Otis Test those items that were found to differentiate most markedly superior from inferior employees . . . For many

industrial jobs the revision differentiates more satisfactorily than does the original form. "

Reliability (from the test manual)

Split half r = .88 to .94

Test-retest r = .82 to .94

Validity

Correlation with Otis Self Administering Test of Mental Ability, Higher exam, thirty minutes = .81 to .87. Distinguishes between good and poor work groups where the criterion is successful performance (manual).

Norms

Time limit norms are based on an industrial population of almost 37,000 adults.

Agreement seems to be general that where a verbal test of intelligence is needed for rough screening purposes or group measurement the Wonderlic serves quite well; Lorge says, "may give fair results." (Buros, 1949)

The Interaction Scale Test (Appendix 4)

The rationale which underlies this attempt to assess attitude to occupation indirectly, is based on the studies cited above

(Flyer, 1952; Chambers, 1957; DeRath, 1959). Essentially the method involves presenting a large number of pictures and having subjects choose the "best liked" and "least liked" person from groups of pictures. The subject then assigns pre-selected traits or categories to the pictures. Personal feelings regarding the trait or category are obtained from the subject, acquaintances or suitable tests, and the two are correlated.

This method was modified for the present study because time for sorting a large number of pictures was not available. It seemed worthwhile to find out if a shorter simplified approach would yield useful results. The obtaining of a large number of equivalent photographs where age and sex variables were controlled was beyond the means of the study so it was decided to try pen and ink drawings. An artist's conception of eight "average" females and eight "average" males was obtained and these were reproduced to provide the stimulus material. Instead of assigning the usual predetermined categories to the pictures, subjects were allowed to choose their own. There were two reasons for this change. First, it was felt that to categorize occupations in eight broad groups would yield results that were in terms of type of work rather than own occupation. Second, it was not possible to have pictures for the many and diverse occupations of such heterogeneous classes. (There were found to be seventy-six

occupations even when occupations were placed in related groups.)

The drawings were identified by letter and each subject was asked to choose the two "best-liked" pictures and the two "least-liked" pictures. They were then asked to assign an occupation to each of these pictures. Where present occupation on questionnaire matched the occupation assigned to the "best-liked" pictures, subject was categorized as "satisfied." Where present occupation matched "least-liked" pictures, subject was categorized as "dissatisfied." Where present occupation did not match either "best-liked" or "least-liked" pictures, subject was categorized as "doubtful." Occupations assigned to pictures were compared with "present" and "ideal" occupations as given on the questionnaire and results tabulated.

The title "Interaction Scale" was selected as descriptive of the intent of the study.

E. Administration of Tests

1. Classes were visited, the study plan explained and an attempt was made to establish rapport and obtain co-operation. The questionnaire was administered with approximately ten minutes allowed for its completion.

2. After allowing an interval of two to four weeks' time to elapse, classes were again visited and the Wonderlic Personnel Test, Form A, and the "Interaction Scale" were administered. Standard directions for the Wonderlic were read and practice exercises completed. Subjects were also told that very few people ever completed the test. The twelve-minute time limit was used. Directions for the "interaction Scale" were read as shown (Appendix 4). A five-minute time limit was used. Subjects were thanked and anyone who asked for results was told that they would be available in the fall.

It must be stressed that the "Interaction Scale" is so named purely for research purposes. It is not and does not purport to be a test, but is rather a tool or a "method."

CHAPTER IV

STATISTICAL METHODS

Since the study was in the nature of a survey of unknown territory, statistical methods used are mainly descriptive. It is felt that such methods are appropriate, and satisfy the basic assumptions that one is able to make about the distribution of the variables within the sample under consideration. To be more specific:

1. Very little is known about this group--hence this study.
2. The scores on the Wonderlic distribute normally.
3. Testing the hypothesis re occupational attitude, there is no basis for knowing how the data distributes; discrete categories are being employed; hence chi square seems appropriate here.

A. Classification Method

Occupational Classification

Using the questionnaire data, subjects' occupations were classified into six occupational levels using Roe's (1956) level classification method. The criterion used in this method is the degree of responsibility which any job possesses. Only in cases where the job named was not clear (e.g. bookkeeper, accountant, auditor, etc.) was reference made to educational level. Regarding the classification of occupation by function, Roe says:

"This classification is based upon degrees of responsibility, capacity and skill. It should be noted that these are not exactly correlated. Wherever there are marked differences, level of responsibility is considered primary. By level of responsibility is meant not only the number and difficulty of the decisions to be made, but also how many different kinds of problems must be decided."

The classification has been adapted to the special demands of this group where there are a greater number of persons in office-type jobs and fewer in skilled and unskilled trades. A distinction has been made between the "upper" and "routine clerical;" but "skilled" and

"semi-skilled" have been combined. Married women working full time were classed according to specific occupation stated, rather than as a "housewife." Students were omitted. The names of the groups have been partly changed but the assignment of individuals to groups followed Roe's scheme.

Classification Levels

- Group I Professional and consulting: independent responsibility. "General no higher authority except the social group."
- Group II Managerial, executive and applied scientific: distinguished from I by degree. "Genuine autonomy may be present but with narrower and less significant responsibilities."
- Group III Administrative, middle managerial, technological and supervisory: low level responsibility for others.
- Group IV Upper clerical and sales: skilled office jobs requiring training.
- Group V Routine clerical and sales: little or no training required.
- Group VI Skilled and semi-skilled (grouped because of size of N): requires varying degrees of apprenticeship, on job or trade training required.

TABLE 9

DIST RIBUTION OF SUBJECTS BY OCCUPATIONAL LEVEL

*Level	I	II	III	IV	V	VI	Housewives	Students
N (255)	21	54	65	29	18	12	42	14
Percentage	8	21	26	11	7	5	16	6

*Wonderlic Minimum cut-off scores assigned to occupational levels.

Level I	35
Level II	30
Level III	28
Level IV	25
Level V	20
Level VI	15

B. Hypothesis 1

Significance of the difference between the Wonderlic means for the sample and the population.

C. Hypothesis 2

A. i. Subjects assigned to six levels by occupation and

and Wonderlic minimum cut-off scores assigned to each class level. (See p. 52)

- ii. Probability of obtaining the distribution by classification levels above and below the Wonderlic median scores for subjects; tested by chi square.
 - iii. Subjects' Wonderlic scores within each occupational level compared with Wonderlic (manual) minimum cut off scores for occupational groupings.
- B.
- i. Subjects categorized as "satisfied" where present occupation agreed with "best-liked" Pictures; and "dissatisfied" where picture did not agree with "best-liked" or agreed with "least-liked" pictures.
 - ii. Ratio of "satisfied" and "dissatisfied" above and below Wonderlic minimum cut off scores was tested by chi square.

D. Hypothesis 3

- i. Answers to direct question re "like occupation" on questionnaire, tabulated.
- ii. Data tabulated on agreement between "best" and "least" liked pictures and present occupation; and on "best-liked" and "ideal" occupation. (Indirect)
- iii. Relationship between responses to direct and indirect methods of assessing occupational attitude tested by chi square.

CHAPTER V

RESULTS

Hypothesis 1

That the intelligence of the sample as measured on the Wonderlic Personnel Test is significantly greater than that of the population.

The standard deviation for the population on which the Wonderlic Personnel Test was standardized was not available. In order to make some assumptions about the Extension Evening Class group in relation to the standardization group, an estimate of the Wonderlic standard deviation was calculated from data reported in the manual (Appendix).

WONDERLIC MANUAL DATA

N	=	36,864
M	=	23.37
*Estimated sd	=	8.39

*Wonderlic manual norms only give percentages and these were converted to frequencies in order to estimate the standard deviation.

TABLE 10

WONDERLIC PERSONNEL TEST MEANS
AND STANDARD DEVIATIONS

	N	M	s. d.
Male	166	30.2	6.74
Female	94	27.9	6.27
TOTAL	260	29.4	6.65

TABLE 11

COMPARISON OF WONDERLIC MEANS FOR
POPULATION AND SAMPLE

	M	s. d.
Population	23.30	8.39
Sample	29.4	6.65

$z = 11.7$
 $P < .001$

Hypothesis 2

That the members of the sample have a level of intelligence above that required by their occupations.

To test the probability of obtaining the occupational grouping by chance, Wonderlic test scores for each group were divided above and below the median for the total group. The obtained chi square appears in Table 12 below.

TABLE 12

SUBJECTS' WONDERLIC SCORES ABOVE AND BELOW
THE OCCUPATION CLASSIFICATION GROUP MEDIAN

Group	I	II	III	IV	V	VI
Above	13	36	42	8	4	2
Below	8	18	23	21	14	10
N = 199	21	54	65	29	18	12

$$\chi^2 = 28.94$$

$$df = 5$$

$$P < .01$$

Each occupational group was divided above and below its assigned Wonderlic minimum cut off score. The percentages of each group surpassing this score appear below in Table 13.

TABLE 13

PERCENTAGES OF OCCUPATIONAL CLASSIFICATION
GROUP WHO SURPASS THEIR MINIMUM WONDERLIC
CUT OFF SCORES

Group	N	M	Median	Range	Wonderlic Min. Cut Off Score	% Surpassing Min. Cut Off Score
I	21	32	34	22-42	35	48
II	54	30	32	18-41	30	63
III	65	31	30	22-41	28	71
IV	29	26	25	18-38	25	55
V	18	26	26	19-34	20	89
VI	12	25	25	16-33	15	100
House- wives	42	29	29	17-36	*	*
Students	14	34	35	24-41	*	*

* No appropriate cut off scores available.

If individuals have more intelligence than their jobs demand one might expect them to be dissatisfied, and such dissatisfaction might be reflected in attitude to occupation as revealed by the

picture-choice data. Scores for each "satisfied" or "dissatisfied" subject were classified as being above or below the Wonderlic minimum cut-off score, assigned to see the occupational level just above the subject's own occupational level." A chi square test of the results (below, Table 14) reveals that such a result could have occurred by chance. There appear to be as many "satisfied" and "dissatisfied" above the testing cut-off score as below it.

TABLE 14

SATISFIED-DISSATISFIED EXTENSION STUDENTS
ABOVE AND BELOW WONDERLIC MINIMUM CUT-OFF
SCORES FOR NEXT OCCUPATIONAL GROUP

		Satisfied	Dissatisfied*
(Wonderlic Min. Cut-Off Score)	Above	16	70
	Below	19	68

$$\chi^2 = .26$$

Null hypothesis is accepted.

$$df = 1$$

$$P = .6$$

* "Doubtful" and "dissatisfied" were grouped for this test.

Hypothesis 3

That measures of direct and indirect attitudes to occupation will not agree.

A. Direct Measure

The answers to the question on the questionnaire which asked: "Do you like your job?" appear below.

TABLE 15

DIRECT ASSESSMENT OF OCCUPATIONAL ATTITUDE

Like			
Generally	Sometimes	Never	No Answer
225	21	5	8

B. Indirect Measure

Table 16 Data presented on agreement between picture choice and present occupation, ("like best" and "like least") and on picture choice and "Ideal" occupation.

Table 17 Relationship between direct and indirect methods of assessing attitude to occupation tested by the chi square.

TABLE 16

INDIRECT ASSESSMENT PICTURE AGREEMENTS WITH
"PRESENT" OCCUPATION AND "IDEAL" OCCUPATION
FOR EXTENSION GROUP

Present Occupation = Picture		"Ideal" Occupation = Picture		Neither	
N =	53		58	78	N=189
Percentage	28		31	41	%=100

TABLE 17

RELATIONSHIP BETWEEN RESPONSES TO DIRECT
AND INDIRECT METHODS OF OCCUPATIONAL
ATTITUDE ASSESSMENT

		DIRECT		
		Satisfied	Doubt	Dissatisfied
INDIRECT	Satisfied	40	0	1
	Doubt	115	13	2
	Dissatisfied	13	2	1

$$\chi^2 = 6.30$$

$$df = 4$$

$$P < .2$$

CHAPTER VI

DISCUSSION OF RESULTS

All results from this study are of necessity interpreted in terms of the tests used.

Data from the Wonderlic Personnel Test (Table 10, 11) indicate that the General Evening Extension Class group has a higher mean intelligence than the mean for the normative group. There are some criticisms of the Wonderlic Personnel Test as an instrument for measuring intelligence, but agreement is general that when used as a group measure it is fairly accurate. The findings in this study are even more meaningful when one considers that factors operated during testing which might have had the effect of lowering test scores. Environmental conditions operated to lower motivation for some classes, and to raise it for others. It must be remembered also that this group has been out of school for some years (see Table 5) and are probably lacking in practice on many of the items of the type included in the Wonderlic. Table 1 indicates that the largest number of the group have had little or no experience with such tests and this

too would probably lower scores to some degree. The age increments added to individual scores would correct for the effect of timing and educational differences, but one wonders if there might be some individual blocking due to the pressure of timing with a consequent score lowering effect. Since data is not available for the method of computing the age increments it is not possible to say whether this factor has been considered. However, most discussions of the effects of age on speed tasks appear to consider the physiological changes affecting mental and psycho-motor functions, rather than the more subtle effects of pressure of timing and decision making. It is possible that an adult group with the characteristics of the one under study may be particularly defensive about educational deficiencies. If this is true, pressure of timing might operate to raise anxiety and lower scores.

It is not possible from the study's data to estimate whether the group's intelligence has been affected by the aging process, but the sample contains a small student group who are all under 30 years, so addition of age increments was not necessary. For this group, with an average age of 20, the mean score is 34. Most of them are first year college students, yet their mean score is higher than that of an older group in the sample, all of whom hold a university degree or degrees. Is this due to superior potential, age, education or the exercise of learning sets? It is not surprising that

when intelligence is measured by intelligence tests on cross-sectional studies the intelligence curve declines with age. Table 10 indicates that intelligence test scores in the sample are lower for females than males, but this too may be due in some degree to differences in practice, for most male subjects exercise numerical skills in their jobs and such items appear in the Wonderlic.

Table 8 reveals that almost one-third of the sample come from rural backgrounds and that few subjects belonged to the socio-economic levels which are associated with higher intelligence scores. Over seventy percent of the sample have only high school or high school plus some special non-degree type of training, (Tables 2, 3) and this finding is consistent with the occupational background of the subjects' fathers. Is the sample's high score on the Wonderlic Test due to a continuing interest in intellectual pursuits or would the score be even higher if such persons had taken university training? As tested intelligence may depend upon environmental exposure as well as native potential it is probable that a group which displays the high motivation which characterizes this one may have suffered from lack of higher educational opportunities.

The mean Wonderlic score for the sample is within one point of the average score for adults with four-year college training in the Wonderlic population. The equivalent A. C. E. score

for the sample mean [from Chester's (1948) data] is 120. This is much higher than Farnum's A.C.E. mean of 107 for a group of extension degree students. It may be argued that the inclusion of so many degree holders in the sample would be expected to raise the Wonderlic mean score, but examination of Tables 4 and 13 reveals that the largest occupational group (N = 65) contains only two holders of degrees yet has a mean score of 31, and for no group does the mean fall below 25.

The question which originally gave rise to this study related to the possibility that individuals were attracted to university extension classes because of their level of intelligence and their strong needs for exercising and developing intellectual potential which were only partially satisfied in their occupations. Table 12 supplies evidence that over half the sample have scores that are equal to or better than the four-year college level for the Wonderlic population (i. e. = 29), and as over 70% of the sample are not college educated it seems safe to assume that the largest number of these individuals possess intellectual potential which might have fitted them for occupations at levels higher than those in which they are now employed. Further evidence for this point can be found on Table 13 where, with one exception, the percentage of individuals

who surpass the Wonderlic minimum cut-off scores increases as occupational level decreases, and all are well above the population mean.

In considering the effect of more intelligence in an individual than his occupation demands, there are of course other factors such as interests to be considered, but even a job which satisfied the individual interests may produce frustration if it does not provide opportunities for what Schaffer calls "creativity-challenge" and "achievement-mastery needs." Ideally then, occupation meets secondary needs as well as primary needs. Research suggests that the greatest opportunity to satisfy secondary needs is found at the occupational levels where there is opportunity for independent responsibility. The data on occupational level classification was tested for level of significance to determine whether such a grouping could be expected to occur on the basis of chance. The median Wonderlic Score for the classified group is 29 and the result is significant at the .01 level. It appears then that the sample may be operating at an occupational level below its intellectual potential. Almost any system of classifying occupations presents difficulties not only in separating occupations by level and by group, but in identifying and classifying a job from the title by which it is known. Examination of the data in Table 12 suggests that the method of classification

used in this study did separate the sample into occupational levels where degree of responsibility was used as the criterion for classification.

Other indicators of unused intellectual potential are the large range of intelligence found at each level and the increase in percentage figures at descending levels for those who surpass minimum cut-off scores. (Table 13)

The results of a chi square test of the relationship between the direct and indirect measures of occupational attitude were not statistically significant, but where $p < .20$ a closer scrutiny of the data for its qualitative significance seems indicated. Because two measures were used the results from each will be considered separately and other relevant data discussed.

Interpretation of results from the direct measure depends upon the measure's efficacy in eliciting meaningful direct responses, and upon the weights of its responses compared to those of the indirect measure. Some doubt exists that "generally" can be assumed to be equal to "best liked", "sometimes" to "doubt," and "never" to "least liked." If there are strong differences in the subjective evaluations of the wordings of the two measures the comparison would be an unequal one. The possibility also exists that occupational attitude is an example of what Getzel refers to as "a socially conflicted object

of inquiry" with its resulting discrepancy between overt and covert levels of response. If this is true, responses from the overt level would be defensive and operate to maximize the number of "polite" responses that would be obtained. Table 15 shows that 90% of the responses were in terms of "generally," so it is possible that the direct measure used may have biased the answers in one direction.

Interpretation of the results from the indirect method used depend in great part upon expectancies based upon the previous research in this area. If, as the studies show, (Flyer 1952, Chambers 1957, De Rath 1959) one can expect subjects to respond to pictures in terms of subjective feeling, the conditions under which such responses can be expected are very important. The purpose of an indirect measure is to minimize possible threat to the individual in a disguised task and permit expression of feelings which may not be expressed directly. To a great extent then the validity of responses depends on presenting a situation in such a way that anxiety is not aroused and answers are not self-protective. It is felt that the close proximity of "best liked" - "least liked" and "assign an occupation" on the same test sheet may have been the cue for defensive activity and responses consciously given. If this is true the relationship obtained is between two direct measures differing only in the degree of

directness when the disguise of the test was penetrated. It is possible also that the number of pictures presented affected the results since previous tests presented 50 (Campbell and Burwen 1956) and 64 (Flyer 1952, De Rath 1959) pictures as picture choice data. The greater number of choices is likely to result in greater reliability.

Previous tests of this type were characterized by the assignment to predetermined categories to pictures, but the method used in this study allowed for free choice of the category assigned to "best liked" and "least liked" pictures. The effect of this is difficult to evaluate as the expectancy for responses of this type could not be known in advance. It would seem to depend upon first, whether the subject saw through the disguise to the purpose of the test; and second, what image the subject had of himself. If his image is unfavorable would he assign his own occupation to "best liked"? There is the point also that the subject would probably have to be extremely satisfied or dissatisfied with his occupation to assign it to the "best liked" or "least liked" picture, particularly if he had comprehended the purpose of the test. If the subject's occupation is no longer of paramount concern to him, as may be the case where subjects have worked for many years, (see Table 5), he may not have strong feelings to project in these terms. The possibility exists also that this group is characterized by ambivalent attitudes toward occupation so

that neither "least" or "best" liked matches the subjective feeling of doubt or partial satisfaction.

Campbell (1956) stresses the importance of controlling pictures for sex and age, and the dangers of making assumptions about the stimulus equivalence of pictures. Sex was controlled in the pictures by presenting separate male and female test forms. But it would be extremely difficult to control for age where the group presents the age range of this one. Some of the pictures appear to be those of young men and women and it is possible that the older subjects did not respond to these in terms of self. The possibility exists too that some of the pictures resemble occupational stereotypes, in which case the occupation assigned might match the picture but say little or nothing about self. There may then have been a difference in stimulus value of the individual pictures used on this test.

The effect of the conditions existing during testing is also difficult to evaluate. What, for example, was the effect of being at the University if it is seen as desirable? There appeared to be more teachers assigned as occupational picture choices than were warranted by the number of teachers in the sample. And if the university is viewed favorably might not the activity of attending Extension classes reduce anxiety which might ordinarily arise in connection with queries re occupation? If this occurred and feelings

regarding occupation were not strong, responses in terms of "best liked" and "least liked" might not be appropriate for feelings in this situation. Another condition which might operate to affect response data pertains to the meaningfulness of the task presented. If the subject was not personally involved in such a task, how meaningful are his responses in terms of self?

Data on Table 16 suggest that to some extent the indirect test was successful in eliciting covert responses, in that twenty-eight percent of the picture-choices matched present occupation as given on the questionnaire. Subjects could assign any occupation to a picture-choice, as they were not forced to choose from a predetermined list of occupations. The inclusion on the questionnaire of the question related to "Ideal" occupation made it possible to differentiate among those picture-choices which did not match "present" occupation, and Table 17 reveals that thirty-one percent of picture-choices matched the "ideal" occupation. It appears that "attitude to occupation" is more complex than can be handled on a satisfaction-dissatisfaction dichotomy and that the group's feelings may be related as much to hope or aspiration as to satisfaction-dissatisfaction. This data raises a question regarding the frame of reference from which a subject responds to a picture. Can we assume that responses to "best-liked" pictures are in terms of reality, or does "best-liked" represent

dreams and aspirations? The previous study of this type investigated occupational aspirations, not experience of college students (DeRath 1959). It is likely that the results of the present study reflect the differential effects of exposure to employment for many years, with judgments in terms of adult experience and its frustration-satisfaction continuum. Marital status and number of children (Tables 6, 7) would influence feelings when responding, and attitudes would reflect conflicts between dreams and reality. Problems such as this in connection with the data from the study are probably what Campbell had in mind when he spoke of "the dangers of an oversimplified one to one interpretation of such material."

The method used in this study does not sufficiently resemble the original studies to permit their use as criteria for judgments. It appears that much more knowledge regarding the variables operating to influence results is required, and that a more careful examination of the assumptions underlying the use of the method would probably lead to more meaningful conclusions. If, in the present study, another method of measuring direct attitude had been used it would probably have been possible to equate the direct and indirect methods. Where favorable direct responses are obtained from 90% of the subjects as opposed to 15% favorable indirect responses, questions arise regarding both the subjects' attitudes and the method used. Guilford (1959)

reports correlations of verbal attitude scales with indirect measures to be around .5, so there is some expectancy with regard to agreement between direct and indirect measures. From this study's data it appears that subjects answer a direct question concerning feelings about occupation differently to an indirect one. There is, as mentioned previously, some relationship between the overt and covert levels of response but not of sufficient degree that any reliance may be placed upon responses to questionnaires which pose direct questions concerning "socially-conflicted" objects of inquiry.

Implications

The General Night Extension Group has demonstrated a level of intelligence which exceeds the occupational demands made upon it. The earlier discussion of the intelligence-occupation relationship suggested that higher level jobs demand high-level intelligence and are associated with the "creativity-challenge" and "achievement-mastery" needs. If job level does not provide this group with opportunities to satisfy such needs it is possible that Extension courses may lessen resulting dissatisfaction in the following ways. First, because college education has prestige value, attending university Extension classes may reduce the anxiety felt by those who have not gone beyond high school. Second, Extension courses may improve adjustment for those who have accepted a lower than original level of aspiration, but who have need for activities suited to a high level of intelligence and which give opportunities for self-expression. Third, in many cases courses are available which

contribute directly toward improving skills needed in occupational life. For all these people Extension classes provide the upper level of available education that does not require formal admission credits and an appropriate means of reducing the anxiety and dissatisfaction which result when occupation and intelligence level are not well matched. While it is true there are many in the group who already hold university degrees, it is suggested that the need for intellectual activity may be felt if daily life does not provide opportunities for the satisfactions which were learned during the college years.

The group is composed of adults, and as Kuhlen (1952) pointed out, goals and satisfactions change with age. Satisfaction is a relative matter and when an activity no longer serves its purpose, the individual moves on in search of other satisfactions. With satisfaction of the primary needs no longer a problem this group of adults is now in search of satisfaction of the higher level social needs. When such satisfactions are not available occupationally, Extension courses can provide a means of improving the adult's life adjustment.

CHAPTER VII

SUMMARY AND CONCLUSIONS

This survey of General Night Extension classes emerged from the speculation that students in these classes should have identifiable characteristics related to their reasons for attending such classes. Two basic areas, intelligence and occupation were studied. It was hypothesized the group was of more than average intelligence and occupationally misplaced in comparison with its intelligence. The expectancy was that such persons would be dissatisfied with their occupations and that although they might not admit to this in answer to a direct question, indirect attitude assessment would demonstrate that occupational dissatisfaction was characteristic of this group. If this were found to be true it would further the understanding of possible motivations for attending Extension classes.

The intelligence scores of the group, even under less than ideal testing conditions, were significantly above average. These scores were compared with the cut-off scores required for entrance to six levels of occupational responsibility, median scores were significantly beyond chance expectation. Because the group's median age is 32 and only 20 percent are beyond the high school level in formal education, it is concluded that lack of educational attainment operates to

the disadvantage of the group in occupational placement. At this age, and with family responsibilities, further education to meet the standards required for the higher levels of occupation is not always possible. Thus Extension courses may provide an outlet for personal and occupational needs for intellectual activity. It is possible too that personality factors deprive the group of opportunity for greater responsibility and achievement, but where motivation is sufficiently high that such courses are attended voluntarily, the probability is that the greater number are held back by lack of formal educational requirements.

The most characteristic finding on the "Interaction Scale" was doubt, so it appears that much exists in the way of conflicting feelings regarding occupation. The lack of any strong expression of approval or disapproval towards occupational involvements suggests that Extension education at the university level may function to lessen dissatisfaction and to further personal adjustment for this group. A list of reasons given for taking such courses strengthens this view (see Appendix 7). The group does appear to realize in a vague, general way that there are unmet needs in their lives and to look to Extension classes to fill these needs. However, it appears that such needs are not always lacking in specificity, for 57% of the group said they would like to have examinations and be given grades, and 79% said they would take Extension courses if they carried credits toward a degree.

The main conclusion from this study, then, is that this is a group of adults of above average intelligence, somewhat "underplaced" with regard to occupation, who attend Extension courses

because of the need to further self actualization. As Anne Roe says

"...capacity is its own motivation... All that a man can be, he must be if he is to be happy. The more he is fitted to do, the more he must do."

CHAPTER VIII

RECOMMENDATIONS

1. The demands of the study did not permit the use of a control group, but such a group is seen as a vital requirement for proof that this group does differ from the average within comparable occupational and educational groups.
2. Extension students taking General Night classes appear to fall into two groups, those with degrees, those without, and it is felt that there are probably important differences between these groups which warrant their separate consideration if further study is contemplated.
3. Further education and preparation for psychological testing of this group are recommended if optimum results are to be obtained at some future time. In

this connection, it would be interesting to see what the effect on scores would be if the Wonderlic Personnel Test were given to this group of adults as a power test rather than a timed test.

4. If a classification of occupation is desired it is suggested that a better system for describing the occupation of the subject be devised. Ideally, a statement of the duties within an occupation should accompany the job name.
5. If further refining and developing of the method used on the "Interaction Scale Test" is seen as desirable the method could be improved by using an eight-point rating scale for direct assessment of occupational attitude. This could be equated with the picture-choice data by rating the pictures from one to eight for desirability and then assigning occupations in this order. Such a modification should result in assessments that are not only more equally weighted subjectively, but which would have the further advantage of yielding a numerical score suited for statistical evaluation.
6. Since there is some indication that attendance falls off as courses progress it might be interesting to apply

some of the devices which often improve motivation and assess the effect of such devices upon attendance. Progress reports, group reports, tests, examinations, are all ideas which might prove useful. Examinations are not ordinarily administered in this type of course but it is suggested that they might be of value if it is desirable to separate the "learners" from the "yearners." If it is proposed that students take more than one course, the original motivation for taking courses needs not only to be maintained but to be stimulated from time to time. With this done, a comparison can then be made with the results of the present study.

The area of adult education appears to be a complex one with difficulties related to the life stage of its students. It does, however, present a challenge to educators to familiarize the general population with the knowledge that intelligence may be maintained by continuing intellectual exercise. Not only is there a responsibility that the citizen in a democracy keep in touch with the trends and developments in society, but the democratic idea implies responsibility to develop intellectual potential to its greatest usefulness for the good of the whole society. Assessment techniques may be developed related specifically to the needs of this group as brought out by this study.

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APPENDIX 1

DEPARTMENT OF EXTENSION
UNIVERSITY OF ALBERTA



EDMONTON, ALBERTA
CANADA

February 3rd, 1960

Dear

During the next few weeks Mrs. Pat Lobsinger, a graduate student at the University, will be visiting our Edmonton evening classes for the purpose of carrying out some psychological tests. Each class will be visited twice, first of all a short visit to secure answers on an information sheet that asks for details of the student's background, and secondly to administer the tests themselves. The first visit will take about 10 minutes and the second about 30 minutes. As far as possible these visits will be timed so as to coincide with the end of a class meeting or with some other natural break in the proceedings.

I feel that these tests may provide us with some very useful information about our students and I would be very grateful for your collaboration with Mrs. Lobsinger when she visits your class.

(I am asking Mrs. Lobsinger to consult with instructors in advance so that we shall be able to administer these tests with a minimum of inconvenience to both students and instructors).

Yours sincerely,

George T. Potter
Extension Assistant

GTP-jb

February, 1960

Children:	Number	Age range
-----------	--------	-----------

Why are you taking extension courses?

If "yes", many few only one

Would you take extension courses if they led to a University degree? Yes No

/PENDING 3

PERSONNEL TEST

FORM A

NAME.....Date.....
(Please Print)

READ THIS PAGE CAREFULLY. DO EXACTLY AS YOU ARE TOLD.
DO NOT TURN OVER THIS PAGE UNTIL YOU ARE
INSTRUCTED TO DO SO.

This is a test of problem solving ability. It contains various types of questions. Below is a sample question correctly filled in:

REAP is the opposite of

1 obtain, 2 cheer, 3 continue, 4 exist, 5 sow [5]

The correct answer is "sow." (It is helpful to underline the correct word.) The correct word is numbered 5. Then write the figure 5 in the brackets at the end of the line.

Answer the next sample question yourself.

Gasoline sells for 23 cents per gallon. What will 4 gallons cost? [____]

The correct answer is 92¢. There is nothing to underline so just place "92¢" in the brackets.

Here is another example:

MINER MINOR—Do these words have

1 similar meaning, 2 contradictory, 3 mean neither same nor opposite? [____]

The correct answer is "mean neither same nor opposite" which is number 3 so all you have to do is place a figure "3" in the brackets at the end of the line.

When the answer to a question is a letter or a number, put the letter or number in the brackets. All letters should be printed.

This test contains 50 questions. It is unlikely that you will finish all of them, but do your best. After the examiner tells you to begin, you will be given exactly 12 minutes to work as many as you can. Do not go so fast that you make mistakes since you must try to get as many right as possible. The questions become increasingly difficult, so do not skip about. Do not spend too much time on any one problem. The examiner will not answer any questions after the test begins.

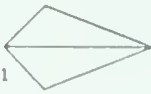
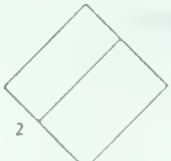

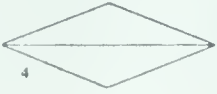
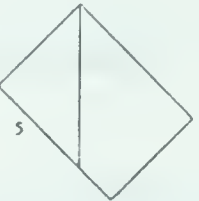
Now, lay down your pencil and wait for the examiner to tell you to begin!


This page is not to be turned until you are told to do so.

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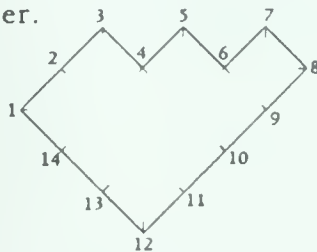
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1. The last month of the year is
1 January. 2 March. 3 July. 4 December. 5 October []
 2. CAPTURE is the opposite of
1 place. 2 release. 3 risk. 4 venture. 5 degrade []
 3. Most of the items below resemble each other. Which one is least like the others?
1 January. 2 August. 3 Wednesday. 4 October. 5 December..... []
 4. Answer by printing YES or No—Does R S V.P. mean "reply not necessary"? []
 5. In the following set of words, which word is different from the others?
1 troop. 2 league. 3 participate. 4 pack. 5 gang []
 6. USUAL is the opposite of
1 rare. 2 habitual. 3 regular. 4 stanch. 5 always []
 7. Which figure can be made from these two parts? []
- 





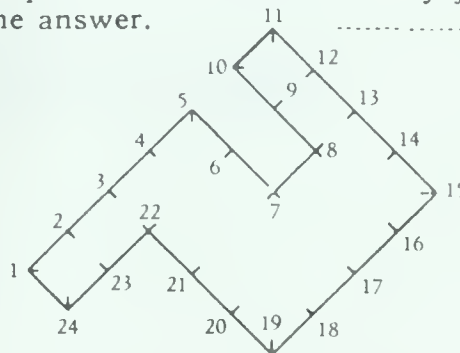

8. Look at the row of numbers below. What number should come next?
8 4 2 1 $\frac{1}{2}$ $\frac{1}{4}$? []
 9. CLIENT CUSTOMER—Do these words have
1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? []
 10. Which word below is related to smell as chew is to teeth?
1 sweet, 2 stink, 3 odor, 4 nose, 5 clean []
 11. AUTUMN is the opposite of
1 vacation, 2 summer, 3 spring, 4 winter, 5 fall..... []
 12. A train travels 300 feet in $\frac{1}{2}$ second. At this same speed, how many feet will it travel in 10 seconds? []
 13. Assume the first 2 statements are true. Is the final one:
1 true, 2 false, 3 not certain?
These boys are normal children. All normal children are active.
These boys are active []
 14. REMOTE is the opposite of
1 secluded, 2 near, 3 far, 4 hasty, 5 exact []
 15. Lemons sell at 3 for 10 cents. How much will $1\frac{1}{2}$ dozens cost?..... []
 16. How many of the five items listed below are exact duplicates of each other? []
- | | |
|----------|----------|
| 84721 | 84721 |
| 9210651 | 9210561 |
| 14201201 | 14210210 |
| 96101101 | 96101161 |
| 88884444 | 88884444 |
17. Suppose you arranged the following words so that they made a true statement. Then print the last letter of the last word as the answer to this problem.
always A verb sentence a has []
 18. A boy is 5 years old and his sister is twice as old. When the boy is 8 years old, what will be the age of his sister? []
 19. IT'S ITS—Do these words have
1 similar meanings, 2 contradictory, 3 mean neither same nor opposite? []
 20. Assume that the first 2 statements are true. Is the final statement:
1 true, 2 false, 3 not certain?
John is the same age as Sally. Sally is younger than Bill. John is younger than Bill. []
 21. A dealer bought some cars for \$4000. He sold them for \$5000, making \$50 on each car. How many cars were involved? []
 22. Suppose you arrange the following words so that they make a complete sentence. If it is a true statement, put a (T) in the brackets; if false, put an (F) there.
eggs lay All chickens []
 23. Two of the following proverbs have the same meaning. Which ones are they?..... []
 1. Many a good cow hath a bad calf.
 2. Like father, like son.
 3. A miss is as good as a mile.
 4. A man is known by the company he keeps.
 5. They are seeds out of the same bowl.
 24. A watch lost 1 minute 18 seconds in 39 days.. How many seconds did it lose per day?.... []
 25. CANVASS CANVAS—Do these words have
1 similar meaning. 2 contradictory, 3 mean neither same nor opposite? []
 26. Assume the first 2 statements are true. Is the final one: 1 true, 2 false, 3 not certain?
All Quakers are pacifists. Some of the people in this room are Quakers. Some of the people in this room are pacifists []
 27. In 30 days a boy saved \$1.00. What was his average daily saving?..... []
 28. INGENIOUS INGENUOUS—Do these words have.
1 similar meanings, 2 contradictory. 3 mean neither same nor opposite? []
 29. Two men caught 36 fish; X caught 5 times as many as Y. How many fish did Y catch?.... []

30. A rectangular bin, completely filled, holds 800 cubic feet of grain. If the bin is 8 feet wide and 10 feet long, how deep is it? []
31. One number in the following series does not fit in with the pattern set by the others. What should that number be? $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{6}$ $\frac{1}{8}$ $\frac{1}{9}$ $\frac{1}{12}$ []
32. Answer this question by printing YES or NO. Does A.D. mean "In the year of our Lord"? []
33. CREDITABLE CREDULOUS—Do these words have
1 similar meaning, 2 contradictory, 3 mean neither same nor opposite? []
34. A skirt requires $2\frac{1}{4}$ yards of material. How many can be cut from 45 yards? []
35. A clock was exactly on time at noon on Monday. At 2 P.M. on Wednesday, it was 25 seconds slow. At that same rate, how much did it lose in $\frac{1}{2}$ hour? []
36. Our baseball team lost 9 games this season. This was $\frac{3}{8}$ of all they played. How many games did they play this season? []
37. What is the next number in this series? 1 .5 .25 .125 ? []
38. This geometric figure can be divided by a straight line into two parts which will fit together in a certain way to make a perfect square. Draw such a line by joining two of the numbers. Then write the numbers as the answer. []

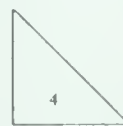
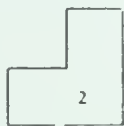
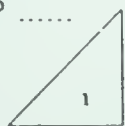


39. Are the meanings of the following sentences 1 similar, 2 contradictory, 3 neither similar nor contradictory? A new broom sweeps clean. Old shoes are easiest. []
40. How many of the five items listed below are exact duplicates of each other? []
- | | |
|------------------|------------------|
| Rexford, J. D. | Rockford, J. D. |
| Singleton, M. O. | Simbleten, M. O. |
| Richards, W. E. | Richard, W. E. |
| Siegel, A. B. | Seigel, A. B. |
| Wood, A. O. | Wood, A. O. |
41. Two of the following proverbs have similar meanings. Which ones are they? []
1. You cannot make a silk purse out of a sow's ear.
 2. He that steals an egg will steal an ox.
 3. A rolling stone gathers no moss.
 4. You cannot damage a wrecked ship.
 5. It is the impossible that happens.

42. This geometric figure can be divided by a straight line into two parts which will fit together in a certain way to make a perfect square. Draw such a line by joining two of the numbers. Then write these numbers as the answer. []



43. Which number in the following group of numbers represents the smallest amount?
10 1 .999 .33 11 []
44. Are the meanings of the following sentences:
1 similar, 2 contradictory, 3 neither similar nor contradictory?
No honest man ever repented for his honesty. Honesty is praised and starves. []
45. For \$1.80 a grocer buys a case of oranges which contains 12 dozen. He knows that two dozen will spoil before he sells them. At what price per dozen must he sell the good ones to gain $\frac{1}{3}$ of the whole cost? []
46. In the following set of words, which word is different from the others?
1 colony, 2 companion, 3 covey, 4 crew, 5 constellation []
47. Assume that the first 2 statements are true. Is the final one: 1 true, 2 false, 3 not certain: Great men are ridiculed. I am ridiculed. I am a great man. []
48. Three men form a partnership and agree to divide the profits equally. X invests \$4500, Y invests \$3500 and Z invests \$2000. If the profits are \$1500, how much less does X receive than if the profits were divided in proportion to the amount invested? []
49. Four of the following 5 parts can be fitted together in such a way as to make a triangle. Which 4 are they? []



50. In printing an article of 30,000 words, a printer decides to use two sizes of type. Using the larger type, a printed page contains 1200 words. Using the smaller type, a page contains 1500 words. The article is allotted 22 pages in a magazine. How many pages must be in the smaller type? []

Date _____

Class Number _____

INTERACTION SCALE

(Men)

INTERACTION SCALE

Below are eight pictures of men, each with an identifying letter.

PART I

Of these pictures:

Which two do you like best?

_____ (Like best)

_____ (Next best)

Which two do you like least?

_____ (Like least)

_____ ("Next least")



A



B



C



D



E



F



G



H

PART II

Now, assign an occupation to each of the men you have chosen above.

Occupation for best liked man _____

" " next best liked _____

Occupation for least liked man _____

" " "next least" liked _____

Date _____

Class Number _____

INTERACTION SCALE

(Women)

INTERACTION SCALE

Below are eight pictures of women, each with an identifying letter.

PART I

Of these pictures:

Which two do you like best?

(Like best)

(Next best)

Which two do you like least?

(Like least)

("Next least")



A



B



C



D



E



F



G



H

PART II

Now, assign an occupation to each of the women you have chosen above.

Occupation for best liked woman _____

" " next best liked _____

Occupation for least liked woman _____

" " "next least" liked _____

APPENDIX 5

WONDERLIC SCORES

(Age Corrected)

	Male	Female	M	F	T
48		/		1	1
47				0	0
46				0	0
45				0	0
44	///		3	0	3
43	//		2	0	2
42	///		3	0	3
41	//// /	/	6	1	7
40	////		4	0	4
39	/		1	0	1
38	//// /	///	6	3	9
37	////		5	0	5
36	//// ////	//	9	2	11
35	//// ///	////	8	5	13
34	//// //// //	////	12	4	16
33	//// /	////	6	4	10
32	//// //// /	////	11	4	15
31	//// /	//// //	6	7	13
30	//// //	//// //	7	7	14
29	//// //	//// ////	7	9	16
28	////	////	5	5	10
27	//// ///	//// ////	8	9	17
26	//// //// /	////	11	5	16
25	//// //	//// /	7	6	13
24	//// /	////	6	4	10
23	//// ////	///	9	3	12
22	//// //	//	7	2	9
21	//// /	///	6	3	9
20	////	//	5	2	7
19	//	//	2	2	4
18		/	0	1	1
17	//	/	2	1	3
16	//		2	0	2
15		/	0	1	1
14			0	0	0
13		/	0	1	1
12		/	0	1	1
7		/	0	1	1

APPENDIX 6

Comparison of Educational Attainment of Population and Sample

	Grade School	High School	High School+	Degree	N
Population N	8,228	14,342	5,016	9,278	36,864
Percentage	22	39	14	25	
Sample N	35	107	60	51	253
Percentage	13	41	26	20	

It will be seen from the data above that there are differences between the Extension Class group and the population for the Wonderlic Personnel Test. The method of grouping under the various educational levels accounts for some of this difference as the sample groupings were only as close an approximation to those of the population as the data available would allow. A chi square test of the differences expected from percentages yielded the following results: $\chi^2 = 28.66$, $P < .01$. The conclusion is that the Extension Class group cannot be considered to be an average industrial sample in terms of Wonderlic expectancy.

APPENDIX 7

Answers to the Question "Reason for taking Extension courses?"

N

- | | | |
|-----|----|--|
| 123 | 1. | Self improvement, to gain knowledge, to broaden interests, mature learning, intellectual discipline. |
| 73 | 2. | Aid in work, promotion, financial betterment, increase work interest. |
| 28 | 3. | Stimulation, outside interest, hobby. |
| 27 | 4. | Specific purposes such as to learn a language for travel, student aid, immigrant, etc. |
| 25 | 5. | Gaps in education, regret lack of university. |
| 10 | 6. | To improve personality, for better social ease, to meet people. |

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